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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/253,611 | 02/19/1999 | PAUL A. FARRAR | 303.572US1 | 5827 |

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EXAMINER

POMPEY, RON EVERETT

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2812

DATE MAILED: 08/27/2002

20

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/253,611

Applicant(s)

FARRAR, PAUL A.

Examiner

Ron E Pompey

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,64,65,68 and 71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,64,65,68 and 71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 2812

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 9 and 11 (their dependent claims also) are rejected under 35

U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amendment filed 1-30-02 was incorrectly entered, because the limitations of "selectively depositing solder only on the exposed portion of the metal contact without depositing solder on the insulating layer" has no support from the originally presented claims or drawings. Therefore, the amendment filed 5-31-02, pertaining to these claims is also rejected based on the same reason.

Claim Rejections - 35 USC ' 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2812

2. Claims 1, 3-12, 64, 65, 68 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook et al. (US 5,457,345) and in further view of Thomas (US 4,661,375) and Strube et al. (US 4,650,548).

Cook disclose the steps of:

For claims 1, 3-12, 64, 65, 68 and 71:

forming a metal contact pad on a substrate (12, fig. 1);

forming an insulating layer on the metal contact pad (14, fig. 1);

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

depositing solder (46, fig. 4), wherein at least one material is selected from the group consisting of lead, tin and bismuth, on the exposed portion of the metal contact pad (44, fig. 4) using selective deposition, further comprises depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition, thereby forming a solder contact (col. 5, Ins. 1-10 and 37-49); and

annealing the solder contact to form a solder ball contact (col. 1, Ins. 36-44), having a diameter in a range of about 2.5 microns to no greater than 100 microns(col. 2, Ins. 1-5).

3. Cook fails to disclose some or all the limitations of claims 1 and 8-12. However,

Thomas discloses the steps of:

For claims 1 and 9-12:

deposition of the solder by immersion.

Art Unit: 2812

Strube discloses the steps of:

For claims 1 and 9-12:

electrolytically depositing solder on the exposed portion of the metal contact pad.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the steps disclosed by Strube in Cook, because said immersion and electrolytically deposition methods are other conventional ways to deposit a solder.

4. For claims 1, 8-12 and 71:

further comprises forming an exposed portion of the metal contact pad having a diameter specific diameter;

wherein the insulating layer has a thickness of approximately 1.5 microns; and

wherein the layer of tin has a thickness of approximately 1.42 microns, further wherein the layer of lead and the layer of tin form a solder contact having a thickness of approximately 2.33 microns.

The examiner takes official notice that it is well known in the art and therefore, *prima facie* obvious to incorporate the above limitations of Cook or Thomas and Strube, because they are conventional thickness, diameters and deposition process. Due to the request by the applicant to verify that these limitations are well known Mohsen, 112 or 111, Fig. 1f, column 5, lines 50-65, disclose insulating layer of thickness 1.5 microns and via that is about 1-2 micron.


Art Unit: 2812


Response to Arguments

3. Applicant's arguments with respect to claims 1, 3-12, 64, 65, 68 and 71, filed 5-31-02, have been considered but are moot in view of the new ground(s) of rejection.

The applicant argues that masks are used or do not specify to not be used in the prior art disclosed, however the language selectively does not limit the examiner from art that does not use a mask. In the art selective deposition does include using a mask. The mask also protects the insulating layer from having solder deposited on it. The Thomas reference discloses immersion, which does not disclose using a mask in the specification or the drawings. Also, the Strube reference is relied upon on to disclose an electrolytic deposition method of solder on a contact pad. The Examiner sees no difference between electrolytic and selective electrolytic deposition, in view of the specification, and therefore hold that it is inherent that the processes are equivalent and read on the claimed invention

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ron E Pompey whose telephone number is (703) 305-3016. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.


Ron Pompey
Art Unit: 2812
August 23, 2002


RICHARD BOOTH
PRIMARY EXAMINER